Jean NOËL

15 place Carnot

F-69002 Lyon, France

Mobile : + 33 (0)6 07 60 88 42

E-Mail : noel@jnlog.com

Site : jnlog.com

Graduated in Engineering (1984)
Ecole Centrale de Lyon

PhD (fluid mechanics, 1989)
Ecole Centrale de Lyon

English (moderate), German (moderate)

EXPERT IN SCIENTIFIC SOFTWARE DEVELOPMENT

Scientific Computing – Complex Systems – Fluid Mechanics/Thermal

- **Analyzing complex scientific and technical problems.**
- **Modeling in physics, applying the mathematics of engineering science** (finite elements/finite volumes, time integration methods, matrix calculation, resolution of linear systems, statistical methods, **Monte-Carlo** and genetic algorithms, **Kalman** filtering and others).
- **Designing a software "product"**: understanding the customer's needs and defining the best response, managing a project, from specifications to acceptance, with maintenance.
- **Developing a program/software in "object" language** and code in **C++** (Visual C++) or **Modelica.**

EXPERT DEVELOPER and PROJECT MANAGER for 13 years

CETIAT – **VILLEURBANNE – France** – Industrial Technical Centre – **Since January 2009**

Technical Centre for Heating, Air Conditioning and Air Handling Industries, **16 M€, 150 pers**.

- **Software developments**
  - Development of the **BOOST tool for 0/1D calculations (100,000 C++ lines)**, development of **Monte-Carlo**, **Pinch**, etc. functionalities, and **25 HVAC models**.
    - Development of **reference models**: stratified storage tank, heat pump and boiler, "nRmC" building, phase change materials, dryers, etc.
    - **Development of a block-diagram type environment** (graphic input, calculations and interactive graphic visualization) for the unsteady simulation of complex systems, with characteristic times from the second to the year. Possibility of semi-virtual simulations.
    - Integration in BOOST of the **Monte-Carlo** method, for the propagation of uncertainties and the global analysis of systems (global method **SOBOL** and local method **MORRIS**).
    - Structuring by **DLL** call (REFPROP, others, etc.), links with TRNSYS, LabView, MATLAB, and Modelica tools (AMESim, Dymola).
  - Development of a **semi-virtual control / command system**, for simulation / test coupling.
    - Coupling of the BOOST simulation tool (other possible) and a test platform, through a database (exchange by **SQL** queries and **OCDB** protocol).
  - Modelling in **OpenModelica** and **Dymola**, with the EDF libraries "**BuildSysPro**" & "**ThermoSysPro**".
- **Studies**
  - **Studies on energy systems** (recovery of fatal energy, simulation of normative tests, control-command of dryers and predictive regulation, etc.) for the 340 customers (Atlantic, Carrier, CIAT, Viessman, etc.).

Freelance in scientific computing – 29 years of activity (1993-2022)

Since 2009, in parallel with salaried activity at CETIAT.

- **Study and software development activity with key accounts**
  - **Mathematical and physical modeling** in thermal / energy (building, industry, etc.).
  - **Software development**: scientific calculation tools and graphical interfaces.
  - **Simulation**: use of the CoDyBa / KoZiBu software to carry out thermal studies.
  - **Main customers (french companies)**: **DGA** (Naval Techniques, for the thermal simulation of the Barracuda submarine program, and LRBA), **Dupont de Nemours**, **EDF**, **INSA de Lyon**, **Lafarge**, **Saint-Gobain**, etc.
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- **Software developed as a FreeLance, with all rights** (more details on **www.jnlog.com**)
  - **CoDyBa / CoDyBa / KoZiBu**: **dynamic thermal simulation of any building**. Based on the geometry of the building and systems (heating/air conditioning), prediction of **temperature** and **humidity**, and **energy consumption** in each room (up to 250 thermal zones).
  - **KaLiBat**: KaLiBat: software for **automatic calculation of thermal bridges**, by automatic meshing in finite volumes of 2D geometries and calculation in 1 s of the regulatory coefficient.

- **Main realizations**

Direction Générale de l'Armement (DGA Techniques Navales – 83 Toulon)

- **Services**: adaptation of the dynamic thermal simulation software CoDyBa / KoZiBu for the simulation of the **new generation Barracuda submarine** (70 thermal zones). Consideration of air exchanges imposed between different ship or submarine areas in the event of an accident.
- **Results**: validation of the software by DGA experiments, maintenance over 18 years.

Dupont de Nemours (Luxembourg)

- **Services**: modeling of the **EnerGain Phase Change Material** (development of a model, validation with INSA Lyon) and development of various tools for optimizing building walls in dynamics.

Direction Générale de l'Armement (Laboratoire de recherches balistiques et aérodynamiques – 27 Vernon)

- **Service**: development of a tool for predicting temperatures in military shelters for the specifications of missile-based weapons and development of a graphical interface.

Lafarge (Centre de Recherche de l'Isle d'Abeau – 38 Saint-Quentin-Fallavier)

- **Service**: development of a software tool for highlighting the interest of concrete according to inertia, insulation, glazed surface, etc. of a building.

EDF (Les Renardières – 77 Moret-sur-Loing)

- **Service**: graphical tool for calculating thermal bridges (IlogView, C/C++), automatic meshing, with automatic refinement on high rotational zones. Calculation by a stationary finite volume method. Restitution of the results by a map developed specifically.

INSA de Lyon (Laboratoire GCU - Domaine scientifique de la Doua – 69 Villeurbanne)

- **Services**: development of simulation tools for educational purposes (CoDyMur, CoDyBa).

Projects ADEME and ANR (French Energy and Research Agencies)

- **Services**: **development of a CAD gateway and study on phase change materials.**

Research Engineer – 7 years

CERAII – **LYON** – Consultant-engineering firm – (**1992**)

Development of a **FORTRAN** program for the automatic and optimized assignment of trucks loading products at the **ELF refinery in Feyzin**. **Error-free operation from commissioning**.

CISI INGENIERIE - EDF-SEPTEN – **VILLEURBANNE** – Nuclear engineering centrer – (**1989**-**1991**)

Service in SEPTEN, for the development of the **Cosaque** nuclear calculation code (monitoring of the decay chain of radioactive material in a nuclear power plant in the event of an accident, tool still in use) and a graphical interface for the code of **Cathare** thermal hydraulics.

TELEMECANIQUE ELECTRIQUE (SCHNEIDER ELECTRIC) - ECULLY – (**1985**-**1989**)

PhD Thesis as a research engineer (fluid mechanics and): simulation of an electric arc plasma.

Interests

Interest in the stock market (management of a stock portfolio, technical analysis)